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REMARKS

Claims 1 and 14 are amended. Claims 10 and 11 are cancelled.

The Examiner indicated that the rejection of claims 1 - 9 and 11 - 22 under 35 U.S.C. §103(a) as being unpatentable over Kashiwaya et al. (U. S. Patent No. 5,595,792), and the rejection of claim 10 under 35 U.S.C. § 103(a) as being unpatentable over Kashiwaya et al. (U. S. Patent No. 5,595,792) in view of Kashiwaya et al. (U. S. Patent No. 5,935,335) or Hudgens et al. (U. S. Patent No. 4,737,379) are withdrawn.

The Examiner further states that claims 1 and 3 - 20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Echizen et al. (U. S. Patent No. 5,527,391) for the reasons set forth in paragraphs 13 - 17 of the previous Office Action; and claims 21 and 22 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Echizen et al. (U. S. Patent No. 5,527,391) in view of Kashiwaya et al. (U. S. Patent No. 5,595,792) for reasons set forth in paragraphs 18 - 19 of the previous Office Action.

Claims 1 and 14 have been rewritten to include the limitations as required in original claim 11. Therefore, the amendments to the claims do not include any new issues for which a new search would be required. Claims 1 and 14, as written, clearly require that the hollow-cathode glow discharge is activated by one of a DC voltage, a pulsed DC voltage, a low-frequency AC voltage, an intermediate-frequency AC voltage, and a high-frequency AC voltage. This requirement is not disclosed in the prior art. The amendments to claims 1 and 14 do not include other activation means, such as microwaves, as claimed in original claim 10 and as disclosed by Echizen et al. Echizen does not show or disclose treating the substrate surfaces by a hollow cathode glow discharge, wherein said discharge is activated by a DC voltage, a pulsed DC voltage or a low-, intermediate-, or high frequency AC voltage. In Echizen, the electrically conductive substrate is only used as an electrode for applying a bias voltage (col. 28, para. 1 - 4 and especially lines 58 - 61, and col. 26, lines 22 - 34). Therefore, the substrate in Echizen is not used to initiate plasma generation as in a hollow cathode discharge process with a discharge activated by a

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DC voltage, a pulsed DC voltage or a low-, intermediate-, or high frequency AC voltage.

Further, in Echizen the excitation of microwave plasmas is restricted to one electrode which serves as the antenna inside of the cavity. The antenna emits microwave radiation in all directions inside of the cavity. Echizen does not teach a hollow cathode effect, despite the hollow shape, because the dielectric tube 103 makes the movement of the electrons perpendicular to the cathode surface impossible. In consequence, the electrons reach the tube more or less without further collisions with other gas particles and recombining at the tube with other ions. This results in a reduction of a high ion density.

On the other hand, according to the present invention, the electrons are moving between the opposite cathode areas several times until their energy is exhausted by the collisions with other gas particles. Therefore, each of these collisions can produce a lot of charge carriers resulting in a much higher plasma density in comparison to Echizen.

Further advantages of the present invention include the long-term stability and the defect-free coating because no elements of the device is integrated inside of the plasma zone.

For the aforementioned reasons, it is believed that claims 1 and 14 are now allowable. Inasmuch as claims 3 - 9, 12 - 13, and 15 - 22 are dependent upon one of claims 1 and 14, then the dependent claims are believed to be allowable also.

This amendment should place this case in condition of passing to issue. Entry of this amendment is requested.

✓ Respectfully submitted,
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VERSION WITH MARKINGS TO SHOW CHANGES MADE**In the claims:**

Please amend claim 1 as follows:

1. (Twice Amended) A process for surface treatment of at least one electrically conducting substrate or a substrate that has been coated so as to be electrically conducting, the process comprising the steps of:

placing a gas in a region of an electric discharge;

restricting the discharge region on at least two opposite sides by surfaces to be treated, wherein the one or more substrates form a hollow cathode; and

treating the substrate surfaces by a hollow-cathode glow discharge, said discharge activated by a DC voltage, a pulsed DC voltage, a pulsed DC voltage or a low-, intermediate-, or high-frequency AC voltage.

Please cancel claims 10 and 11.

Please amend claim 14 as follows:

14. (Thrice Amended) A device for surface treatment of at least one electrically conducting substrate or a substrate that has been coated so as to be electrically conducting, the device comprising:

at least one substrate defining a discharge region enclosed on at least two sides by substrate surfaces;

means for supplying electrical energy to the discharge region;

a vacuum chamber to enclose the discharge region;

means for supplying gas to the vacuum chamber;

means for removing gas from the vacuum chamber; and

an anode placed in the region of the at least one substrate;

wherein the at least one substrate forms a hollow cathode, and wherein the at least one substrate is surface treated by a hollow-cathode glow discharge activated by a DC voltage, a pulsed DC voltage, or a low-, intermediate-, or high-frequency AC voltage.